

Remarks

The foregoing amendment amends claim 5 for purposes of clarity. Pending in the application are claims 1-32, of which claims 1-4 and 9-32 are withdrawn from further consideration. The following comments address all stated grounds for rejection and place claims 5-8, of which claim 5 is independent, in condition for allowance.

Claim Amendments

Applicants amend claim 5 to clarify the scope of the present invention. Claim 5 is amended to recite that a fuel gas supply port and an oxygen-containing gas supply port are formed at the upper portion of end edges on the short sides of fuel cell units, respectively, and a fuel gas discharge port and an oxygen-containing gas discharge port are formed at the lower portion of end edges on the short sides of the fuel cell units, respectively, such that the fuel gas supply port and the oxygen-containing gas supply port are provided at diagonal positions with respect to the fuel gas discharge port and the oxygen-containing gas discharge port, respectively. Support for the amendment can be found at page 9, line 23 through page 10, line 3 and page 10, line 25 through page 11, line 8 in the specification of the pending application. No new matter is added.

Amendments to the Specification

The specification is amended to address typographical errors. No new matter is added.

35. U.S.C. §103 Rejections

Claims 5 and 6 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Number 6,096,450 ("Walsh"). Applicants respectfully traverse the rejection and submit that claims 5 and 6 are patentable over the cited prior art.

Claim 5 recites a fuel cell stack with a plurality of fuel cell units stacked. Each fuel cell unit has a rectangular shape having a horizontal length longer than a vertical length. A fuel gas supply port and an oxygen-containing gas supply port are formed at the upper portion of end edges on short sides of the fuel cell units, respectively, and a fuel gas discharge port and an oxygen-containing gas discharge port are formed at the lower portion

of end edges on short sides of the fuel cell units, respectively. The fuel gas supply port and oxygen-containing gas supply port are provided at diagonal positions with respect to the fuel gas discharge port and the oxygen-containing gas discharge port, respectively. A plurality of fuel gas flow passages connects the fuel gas supply port to the fuel gas discharge port for supplying a fuel gas to an anode electrode. The fuel gas flow passages are serpentine passages each having two turns. A plurality of oxygen-containing gas flow passages connects the oxygen-containing gas supply port to the oxygen-containing gas discharge port for supplying an oxygen-containing gas to a cathode electrode. The oxygen-containing gas flow passages are serpentine passages each having two turns. Claim 6 depends from claim 5 and adds separate and patentable limitations to claim 5.

Applicants submit that Walsh does not teach that *each fuel cell unit has a rectangular shape having a horizontal length longer than a vertical length, and a fuel gas supply port and an oxygen-containing gas supply port are formed at an upper portion of end edges on short sides of the fuel cell units, respectively, and a fuel gas discharge port and an oxygen-containing gas discharge port are formed at a lower portion of end edges on short sides of the fuel cell units, respectively*, as recited in claim 5.

The Walsh reference teaches a fuel cell assembly including fluid flow plates. Fig. 2 of the Walsh reference depicts the fluid flow plate (200) having ports (206, 208) and a plurality of parallel flow channels (204). The Walsh reference teaches that the vertical length of the fluid flow plate is longer than the horizontal length of the fluid flow plate.

In contrast, the fuel cell unit recited in claim 5 has a rectangular shape with a horizontal length longer than a vertical length. A fuel gas supply port and an oxygen-containing gas supply port are formed at an upper portion of end edges on short sides of the fuel cell units, respectively, and a fuel gas discharge port and an oxygen-containing gas discharge port are formed at a lower portion of end edges on short sides of the fuel cell units, respectively. The fuel gas supply port and oxygen-containing gas supply port are provided at diagonal positions with respect to the fuel gas discharge port and the oxygen-containing gas discharge port, respectively.

With this arrangement, the fuel cell stack recited in claim 5 can be accommodated under the floor of a vehicle, which requires a low height. Therefore, the fuel cell stack

recited in claim 5 provides for a compact structure having a rectangular configuration and low height suitable for placement under the floor of a vehicle. In the Walsh reference, the vertical length of the fluid flow plate is longer than the horizontal length of the fluid flow plate. The Walsh reference does not teach the low height structure of the fuel cell stack recited in claim 5.

Furthermore, Applicants submit that the Walsh reference does not teach that *the fuel gas supply port and oxygen-containing gas supply port are provided at diagonal positions with respect to the fuel gas discharge port and the oxygen-containing gas discharge port, respectively, and the fuel gas flow passages and the oxygen-containing gas flow passages are serpentine passages each having two turns*, as recited in claim 5.

In the Office Action, the Examiner recognizes that the Walsh reference does not teach this feature of the invention recited in claim 5. The Examiner, however, asserts that this feature is an obvious design choice because such a modification involves a mere change for a particular configuration. Applicants respectfully disagree with the Examiner's position.

As described above, the fuel cell stack recited in claim 5 has a horizontal length longer than a vertical length so that the fuel cell stack can be placed under the floor of a vehicle. Furthermore, since the fuel gas supply port is provided at a diagonal position with respect to the fuel gas discharge port in the fuel cell unit recited in claim 5, the fuel gas flow passage connecting the fuel gas supply port to the fuel gas discharge port may be serpentine passages. The fuel cell stack recited in claim 5 provides a low height by limiting the serpentine fuel gas passages and oxygen-containing gas passages to include two turns. Applicants submit that providing a fuel cell unit having a rectangular configuration and low height suitable for placement under the floor of a vehicle is not a design choice, but rather requires a great deal of engineering efforts.

For the foregoing reasons, Applicants submit that claims 5 and 6 distinguish patentably over the prior art. As such, the Applicants respectfully request that the Examiner reconsider and withdraw the rejection of claims 5 and 6 under 35 U.S.C. 103(a), and pass the claims to allowance.

35. U.S.C. §103 Rejections

Claims 5-8 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Number 6,048,633 ("Fujii"). Applicants respectfully traverse the rejection

Applicants note that the Fujii reference has a U.S. filing date of November 10, 1998 and an issue date of April 11, 2000. The present application is a continuation of U.S. Patent Application No. 09/641,187 which claims priority to Japanese Patent Application No. 11-247790 filed on September 1, 1999. A verified English translation of Japanese Patent Application No. 11-247790 is enclosed herewith to rely upon the earlier filing date.

The Fujii reference therefore qualifies as prior art under 35 U.S.C. §102(e). Applicants also note that the present application and the Fujii reference are assigned to the same assignee. Applicants submit that the claimed invention of the present application and the subject matter described in the Fujii reference were, at the time the claimed invention was made, owned by the same person or subject to an obligation of assignment to the same person. In light of this, the Fujii reference does not preclude the patentability of the present application under 35 U.S.C. §103(a). 35 U.S.C. §103(c). Applicants therefore request that the Examiner reconsider and withdraw the rejection of claims 5-8 under 35 U.S.C. §103(a), and pass the claims to allowance.

Drawings


On the Office Action Summary, the drawings are not indicated to be accepted or objected to by the Examiner. Applicants respectfully request that the Examiner clearly indicate whether the drawings are accepted or objected to.

Conclusion

In view of above, Applicants contend that the pending application is in condition for allowance.

Dated: November 13, 2006

Respectfully submitted,

By 

Anthony A. Laurentano

Registration No.: 38,220

LAHIVE & COCKFIELD, LLP

One Post Office Square

Boston, Massachusetts 02109

(617) 227-7400

(617) 742-4214 (Fax)

Attorney/Agent For Applicant